Author Index

Alexander, I. J. (see Gordon, C.), 243
Allen, S. J. (see Nehl, D. B.), 495
Aloni, R. (see Kalev, N.), 307
Andalo, C., Mazer, S. J., Godelle, B. & Machon, N., Parental environmental effects on life history traits in *Arabidopsis thaliana* (Brassicaceae), 173
Antonsen, F., Johnsson, A., Futsaether, C. & Krane, J., Nuclear magnetic resonance imaging in studies of gravitropism in soil mixtures, 59
Aplin, D. M. (see Gange, A. C.), 123
Armstrong, J. & Armstrong, W., *Phragmites* die-back: toxic effects of propionic, butyric and caproic acids in relation to pH, 201
Armstrong, W. (see Armstrong, J.), 201
Balls, G. R. (see Bungener, P.), 271
Bashor, C. J. & Dalton, D. A., Effects of exogenous application and stem infusion of ascorbate on soybean (*Glycine max*) root nodules, 19
Bengough, A. G. & Kirby, J. M., Tribology of the root cap in maize (*Zea mays*) and peas (*Pisum sativum*), 421
Berin, D. M. (see Craine, J. M.), 475
Berta, G. (see Fusconi, A.), 505
Boddington, C. L. & Dodd, J. C., Evidence that differences in phosphate metabolism in mycorrhizas formed by species of *Glomus* and *Gigaspora* might be related to their life-cycle strategies, 531
Boddy, L. (see Wells, J. M.), 325
Bogeat-Triboulot, M.-B. (see Martre, P.), 435
Boller, T. (see Schellenbaum, L.), 67
——, (see Müller, J.), 551
Bonfante, P. (see Lanfranco, L.), 347
Bortlik, K. (see Müller, J.), 551
Boucaud, J. (see Louahlia, S.), 451
Bower, E. (see Gange, A. C.), 123
Bracken, M. (see Gange, A. C.), 123
Brooker, R. W., Callaghan, T. V. & Jonasson, S., Nitrogen uptake by rhizomes of the clonal sedge *Carex bigelowii*: a previously overlooked nutritional benefit of rhizomatous growth, 35
Bungener, P., Balls, G. R., Nussbaum, S., Geissmann, M., Grub, A. & Fuhrer, J., Leaf injury characteristics of grassland species exposed to ozone in relation to soil moisture condition and vapour pressure deficit, 271
——, Nussbaum, S., Grub, A., Fuhrer, J., Growth response of grassland species to ozone in relation to soil moisture condition and plant strategy, 283
Caba, J. M., Poveda, J. L., Gresshoff, P. M. & Ligero, F., Differential sensitivity of nodulation to ethylene in soybean cv. Bragg and a supernodulating mutant, 233
Cairney, J. W. G. (see Hartley, J.), 141
——, (see Sawyer, N. A.), 561
Cairns, A. J., Nash, R., Machado de Carvalho, M.-A. & Sims, I. M., Characterization of the enzymatic polymerization of 2,6-linked fructan by leaf extracts from timothy grass (*Phleum pratense*), 79
Callaghan, T. V. (see Brooker, R. W.), 35
Chagvardieff, P. (see Louche-Tessandier, D.), 539
Chambers, S. M. (see Sawyer, N. A.), 561
Cooper, J. B. (see Kaska, D. D.), 49
Craine, J. M., Berin, D. M., Reich, P. B., Tilman, D. G. & Knops, J. M. H., Measurement of leaf longevity of 14 species of grasses and forbs using a novel approach, 475
Cramer, M. D., Gao, Z. F. & Lips, S. H., The influence of dissolved inorganic carbon in the rhizosphere on carbon and nitrogen metabolism in salinity-treated tomato plants, 441
Dahlberg, A. (see Jonsson, L.), 151
Dakora, F. D. (see Nelwamondo, A.), 463
Dalton, D. A. (see Bashor, C. J.), 19
Desjardins, Y. (see Louche-Tessandier, D.), 539
Dodd, J. C. (see Boddington, C. L.), 531
Dumas-Gaudot, E. (see Slezack, S.), 517
Durand, J.-L. (see Martre, P.), 435
Ekblad, A. (see Högberg, P.), 569
Erland, S. (see Mahmood, S.), 577
Finlay, R. D. (see Mahmood, S.), 577
Fuhrer, J. (see Bungener, P.), 271, 283
Funayama, S. & Terashima, I., Effects of geminivirus infection and growth irradiance on the vegetative growth and photosynthetic production of *Eupatorium makinoi*, 483
Fusconi, A., Gnavi, E., Trotta, A. & Berta, G., Apical meristems of tomato roots and their modifications induced by arbuscular mycorrhizal and soilborne pathogenic fungi, 505
Futsaether, C. (see Antonsen, F.), 59
Gange, A. C., Bower, E., Stagg, P. G., Aplin, D. M., Gillam, A. E. & Bracken, M., A comparison of visualization techniques for recording arbuscular mycorrhizal colonization, 123
Gao, Z. F. (see Cramer, M. D.), 441
Gebauer, G. & Taylor, A. F. S., ^{15}N natural abundance in fruit bodies of different functional groups of fungi in relation to substrate utilization, 93
Geissmann, M. (see Bungener, P.), 271
Gianinazzi, S. (see Slezack, S.), 517
Gillam, A. E. (see Gange, A. C.), 123
Gnavi, E. (see Fusconi, A.), 505
Godelle, B. (see Andalo, C.), 173
Gordon, C., Woodin, S. J., Alexander, I. J. & Mullins, C. E., Effects of increased temperature, drought and nitrogen supply on two upland perennials of contrasting functional type: *Calluna vulgaris* and *Pteridium aquilinum*, 243
Gresshoff, P. M. (see Caba, J. M.), 233
Grub, A. (see Bungener, P.), 271, 283
Harper, D. B., Harvey, B. M. R., Jeffers, M. R. & Kennedy, J. T., Emissions, biogenesis and metabolic utilization of chloromethane by tubers of the potato (*Solanum tuberosum*), 5
Harris, M. J. (see Wells, J. M.), 325
Hartley, J., Cairney, J. W. G. & Meharg, A. A., Cross-colonization of Scots pine (*Pinus sylvestris*) seedlings by the ectomycorrhizal fungus *Paxillus involutus* in the presence of inhibitory levels of Cd and Zn, 141
Harvey, B. M. R. (see Harper, D. B.), 5
Haukioja, E. (see Henriksson, J.), 469
Henriksson, J., Haukioja, E. & Ruohomäki, K., Impact of leaf damage on growth of mountain birch shoots, 469
Hernández-Sebastià, C. (see Louche-Tessandier, D.), 539
Högberg, M. N. (see Högberg, P.), 569
Högberg, P., Högberg, M. N., Quist, M. E., Ekblad, A. & Näsholm, T., Nitrogen isotope fractionation during nitrogen uptake by ectomycorrhizal and non-mycorrhizal *Pinus sylvestris*, 569
Humphreys, M. (see Louahlia, S.), 451
Hyde, K. D. (see Taylor, J. E.), 335
Jakobsen, I. (see Ravnskov, S.), 113
James, A. R. (see Thomas, H.), 295
James, E. K. & Sprent, J. I., Development of N_2-fixing nodules on the wetland legume *Lotus uliginosus* exposed to conditions of flooding, 219
Jeffers, M. R. (see Harper, D. B.), 5
Johnsson, A. (see Antonsen, F.), 59
Jonasson, S. (see Brooker, R. W.), 35
Jones, E. B. G. (see Taylor, J. E.), 335
Jonsson, L., Dahlberg, A., Nilsson, M-C., Kárén, O. & Zackrisson, O., Continuity of ectomycorrhizal fungi in self-regenerating boreal *Pinus sylvestris* forests studied by comparing mycobiont diversity on seedlings and mature trees, 151
Kalev, N. & Aloni, R., Role of ethylene and auxin in regenerative differentiation and orientation of tracheids in *Pinus pinea* seedlings, 307
Kárén, O. (see Jonsson, L.), 151
Kaska, D. D., Myllylä, R. & Cooper, J. B., Auxin transport

inhibitors act through ethylene to regulate dichotomous branching of lateral root meristems in pine, 49
KENNEDY, J. T. (see HARPER, D. B.), 5
KIRBY, J. M. (see BENGOUGH, A. G.), 421
KIRK, G. J. D., SANTOS, E. E. & SANTOS, M. B., Phosphate solubilization by organic anion excretion from rice growing in aerobic soil: rates of excretion and decomposition, effects on rhizosphere pH and effects on phosphate solubility and uptake, 185
KJØLLER, R. (see SLEZACK, S.), 517
KNOPS, J. M. H. (see CRAINE, J. M.), 475
KRANE, J. (see ANTONSEN, F.), 59
LANFRANCO, L., VALLINO, M. & BONFANTE, P., Expression of chitin synthase genes in the arbuscular mycorrhizal fungus *Gigaspora margarita*, 347
LEVERENZ, J. W., PALUDAN-MÜLLER, G. & SAXE, H., Response to three seasons of elevated ozone in the progeny of healthy and unhealthy Norway spruce trees from a plantation with the 'top dying' syndrome, 259
LIGERO, F. (see CABA, J. M.), 233
LIN, C.-L., LIN, H.-C., WANG, A.-Y. & SUNG, H.-Y., Purification and characterization of an alkaline invertase from shoots of etiolated rice seedlings, 427
LIN, H.-C. (see LIN, C.-L.), 427
LIPS, S. H. (see CRAMER, M. D.), 441
LIPSON, D. A., SCHADT, C. W., SCHMIDT, S. K. & MONSON, R. K., Ectomycorrhizal transfer of amino acid-nitrogen to the alpine sedge *Kobresia myosuroides*, 163
LOUAHLIA, S., MACDUFF, J. H., OURRY, A., HUMPHREYS, M. & BOUCAUD, J., Nitrogen reserve status affects the dynamics of nitrogen remobilization and mineral nitrogen uptake during recovery of contrasting cultivars of *Lolium perenne* from defoliation, 451
LOUCHE-TESSANDIER, D., SAMSON, G., HERNÁNDEZ-SEBASTIÀ, C., CHAGVARDIEFF, P. & DESJARDINS, Y., Importance of light and CO_2 on the effects of endomycorrhizal colonization on growth and photosynthesis of potato plantlets (*Solanum tuberosum*) in an *in vitro* tripartite system, 539
MACDUFF, J. H. (see LOUAHLIA, S.), 451
MCGEE, P. A. (see TORRISI, V.), 103
MACHADO DE CARVALHO, M.-A. (see CAIRNS, A. J.), 79
MACHON, N. (see ANDALO, C.), 173
MAHMOOD, S., FINLAY, R. D. & ERLAND, S., Effects of repeated harvesting of forest residues on the ectomycorrhizal community in a Swedish spruce forest, 577
MARTRE, P., BOGEAT-TRIBOULOT, M.-B. & DURAND, J.-L., Measurement of a growth-induced water potential gradient in tall fescue leaves, 435
MASSICOTTE, H. B., MELVILLE, L. H., PETERSON, R. L. & MOLINA, R., Biology of the ectomycorrhizal fungal genus, *Rhizopogon*, 355
MAZER, S. J. (see ANDALO, C.), 173
MCGEE, P. A. (see NEHL, D. B.), 495
MCLAUGHLIN, S. B. & WIMMER, R., Tansley Review No. 104 Calcium physiology and terrestrial ecosystem processes, 373
MEHARG, A. A. (see HARTLEY, J.), 141
MELVILLE, L. H. (see MASSICOTTE, H. B.), 355
MOHR, U. (see MÜLLER, J.), 551
MOLINA, R. (see MASSICOTTE, H. B.), 355
MONSON, R. K. (see LIPSON, D. A.), 163
MÜLLER, J., MOHR, U., SPRENGER, N., BORTLIK, K., BOLLER, T. & WIEMKEN, A., Pool sizes of fructans in roots and leaves of mycorrhizal and non-mycorrhizal barley, 551
MULLINS, C. E. (see GORDON, C.), 243
MYLLYLÄ, R. (see KASKA, D. D.), 49
NASH, R. (see CAIRNS, A. J.), 79
NÄSHOLM, T. (see HÖGBERG, P.), 569
NEGREL, J. (see SLEZACK, S.), 517
NEHL, D. B., MCGEE, P. A., TORRISI, V., PATTINSON, G. S. & ALLEN, S. J., Patterns of arbuscular mycorrhiza down the profile of a heavy textured soil do not reflect associated colonization potential, 495
NELWAMONDO, A. & DAKORA, F. D., Silicon promotes nodule formation and nodule function in symbiotic cowpea (*Vigna unguiculata*), 463
NILSSON, M-C. (see JONSSON, L.), 151
NUSSBAUM, S. (see BUNGENER, P.), 271, 283
NYBROE, O. (see RAVNSKOV, S.), 113
OLESNIEWICZ, K. S. & THOMAS, R. B., Effects of mycorrhizal colonization on biomass production and nitrogen fixation of black locust (*Robinia pseudoacacia*) seedlings grown under elevated atmospheric carbon dioxide, 133
OURRY, A. (see LOUAHLIA, S.), 451
PALUDAN-MÜLLER, G. (see LEVERENZ, J. W.), 259
PATTINSON, G. S. (see TORRISI, V.), 103
——, (see NEHL, D. B.), 495
PAYNOT, M. (see SLEZACK, S.), 517
PETERSON, R. L. (see MASSICOTTE, H. B.), 355
POVEDA, J. L. (see CABA, J. M.), 233
QUIST, M. E. (see HÖGBERG, P.), 569
RAVNSKOV, S., NYBROE, O. & JAKOBSEN, I., Influence of an arbuscular mycorrhizal fungus on *Pseudomonas fluorescens* DF57 in rhizosphere and hyphosphere soil, 113
REICH, P. B. (see CRAINE, J. M.), 475
ROSENDAHL, S. (see SLEZACK, S.), 517
RUOHOMÄKI, K. (see HENRIKSSON, J.), 469
SAMSON, G. (see LOUCHE-TESSANDIER, D.), 539
SANTOS, E. E. (see KIRK, G. J. D.), 185
SANTOS, M. B. (see KIRK, G. J. D.), 185
SAWYER, N. A., CHAMBERS, S. M. & CAIRNEY, J. W. G., Molecular investigation of genet distribution and genetic variation of *Cortinarius rotundisporus* in eastern Australian sclerophyll forests, 561
SAXE, H. (see LEVERENZ, J. W.), 259
SCHADT, C. W. (see LIPSON, D. A.), 163
SCHELLENBAUM, L., SPRENGER, N., SCHÜEPP, H., WIEMKEN, A. & BOLLER, T., Effects of drought, transgenic expression of a fructan synthesizing enzyme and of mycorrhizal symbiosis on growth and soluble carbohydrate pools in tobacco plants, 67
SCHMIDT, S. K. (see LIPSON, D. A.), 163
SCHÜEPP, H. (see SCHELLENBAUM, L.), 67
SIMS, I. M. (see CAIRNS, A. J.), 79
SLEZACK, S., DUMAS-GAUDOT, E., ROSENDAHL, S., KJØLLER, R., PAYNOT, M., NEGREL, J. & GIANINAZZI, S., Endoproteolytic activities in pea roots inoculated with the arbuscular mycorrhizal fungus *Glomus mosseae* and/or *Aphanomyces euteiches* in relation to bioprotection, 517
SPRENGER, N. (see SCHELLENBAUM, L.), 67
——, (see MÜLLER, J.), 551
SPRENT, J. I. (see JAMES, E. K.), 219
STAGG, P. G. (see GANGE, A. C.), 123
STÖHR, C. (see WITT, F. G.), 27
SUNG, H.-Y. (see LIN, C.-L.), 427
TANG, E. P. Y. & VINCENT, W. F., Strategies of thermal adaptation by high-latitude cyanobacteria, 315
TAYLOR, A. F. S. (see GEBAUER, G.), 93
TAYLOR, J. E., HYDE, K. D. & JONES, E. B. G., Endophytic fungi associated with the temperature palm, *Trachycarpus fortunei*, within and outside its natural geographic range, 335
TERASHIMA, I. (see FUNAYAMA, S.), 483
THOMAS, H. & JAMES, A. R., Partitioning of sugars in *Lolium perenne* (perennial ryegrass) during drought and on rewatering, 295
THOMAS, R. B. (see OLESNIEWICZ, K. S.), 133
TILMAN, D. G. (see CRAINE, J. M.), 475
TORRISI, V., PATTINSON, G. S. & MCGEE, P. A., Localized elongation of roots of cotton follows establishment of arbuscular mycorrhizas, 103
——, (see NEHL, D. B.), 495
TROTTA, A. (see FUSCONI, A.), 505
ULLRICH, W. R. (see WITT, F. G.), 27
VALLINO, M. (see LANFRANCO, L.), 347
VINCENT, W. F. (see TANG, E. P. Y.), 315
WANG, A.-Y. (see LIN, C.-L.), 427
WELLS, J. M., HARRIS, M. J. & BODDY, L., Dynamics of mycelial growth and phosphorus partitioning in developing mycelial cord systems of *Phanerochaete velutina*: dependence on carbon availability, 325
WIEMKEN, A. (see SCHELLENBAUM, L.), 67
——, (see MÜLLER, J.), 551
WIMMER, R. (see MCLAUGHLIN, S. B.), 373
WITT, F. G., STÖHR, C. & ULLRICH, W. R., Soluble and membrane-associated nitrate reductases in the dinoflagellate *Peridinium gatunense*, 27
WOODIN, S. J. (see GORDON, C.), 243
ZACKRISSON, O. (see JONSSON, L.), 151

Subject Index

Acid Fuchsin, 123
Aerenchyma, 201
Alkaline invertase, 427
Alkaline phosphatase, 531
Alpine, 163
AM fungi, 347
Amino acid, 163
Aminoethoxyvinylglycine, 49
Ammonium, 451
Anatomy, 355
Antarctic, 315
Antioxidant, 19
Aphanomyces euteiches, 517
Arabidopsis thaliana, 173
Arbuscula mycorrhizal fungi, 67
Arbuscular mycorrhiza, 123, 133, 495
Arbuscular mycorrhizal fungi, 517, 531
Arctic, 35, 315
Artificial neural networks, 271
Ascorbate, 19
Ascorbate peroxidase, 19
Assimilate partitioning, 551
Autofluorescence, 123
Auxiliary cells, 531
Auxin transport inhibitors, 49
Avena sativa, 59
Bacteria–fungus interactions, 113
Bioassay, 495
Biocontrol, 505
Biofuel, 577
Biogeography, 335
Biomass production, 133
Bioprotection, 517
Biosynthesis and metabolism of chloromethane, 5
Cadmium, 141
Calcium, 373
Calluna vulgaris, 243
Carbohydrate metabolism, 551
Carbon limitation, 325
Carbon partitioning, 67, 315
Carex bigelowii (stiff sedge), 35
Cedar Creek, 475
Cell osmotic pressure, 435
Cell turgor pressure, 435
Characterization, 427
Chitin, 347
Chitin synthase, 347
Chlorazol Black, 123
Chloromethane, 5
Chlorophyll, 259
Chlorophyll-a fluorescence, 539
Citric acid, 185
Clonal integration, 35
CO_2 enrichment, 539
Coleoptiles, 59
Community structure, 577
Cowpea, 463
Crystals, 355
Cyanobacteria, 315
Cyperaceae, 163
$\delta^{15}N$, 93, 569
Defoliation, 451, 469
Dichotomous branching, 49
Differential expression, 347
Diffusion, 185
Dinoflagellate (Dinophyta, Pyrrophyta) nitrate reductase, 27
Drought, 243
Drought resistance, 295
Drought stress, 67
Ecosystem, 373
Ectomycorrhiza, 49, 569, 577
Ectomycorrhizal diversity, 151
Ectomycorrhizal fungi, 141, 561
Ectomycorrhizas, 163
Elevated CO_2, 133
Emission, 5
Endophyte, 335
Endoproteolytic activities, 517
Environmental effects, 173
Ethylene, 49, 233
Eupatorium makinoi, 483
Festuca arundinacea (tall fescue), 435
Flooding, 219
Forb, 475
Forests, 373
Fractals, 325
Friction, 421
Fructan, 67, 295
Fructans, 451
Fructosyltransferases, 551
Function, 373
Fungal diversity, 335
Fungi, 93
Gas exchange, 259
Geminivirus, 483
Gene, 347
Gigaspora, 531
Gigaspora margarita, 347
Glomus, 531
Glomus intraradices, 539
Glycine max (soybean), 19, 233
Glycosyl-linkage analysis, 79
Gossypium hirsutum (cotton), 495
Grass, 475
Grassland species, 271, 283
Gravitropism, 59
Growth, 283
Growth analysis, 483
Half-sib families, 259
Hartig net, 355
Hyphosphere, 113
Internal transcribed spacer (ITS) sequences, 561
Invertase, 79
ITS region, 577
ITS-RFLP, 151, 561
Kobresia myosuroides, 163
Leaf growth (elongation zone), 435
Leaf longevity, 475
Leaf photosynthesis, 483
Lipid peroxides, 19
Lolium perenne, 451
Lolium perenne (perennial ryegrass), 295
Long-shoot growth, 469
Lotus uliginosus, 219
Lycopersicon esculentum (tomato), 441
Mantle, 355
Maternal effects, 173
Membrane-bound, 27
Micropropagation, 539
Microsatellite-primed PCR, 561
Modularity, 469
Mountain birch, 469
Mucilage, 421
Mycelial networks, 325
Mycorrhiza, 539
Mycorrhizal colonization, 495
Mycorrhizal roots, 347
Mycorrhizas, 505
N_2 fixation, 133, 219, 463
NAR, 483
Nitrate, 451
Nitrate reductase, 441
Nitrogen, 93, 163, 243, 569
Nitrogen fixation, 19

Nitrogen source partitioning, 133
Nitrogen uptake, 35
NMR imaging, 59
Nodulation, 233, 463
Non-Mendelian inheritance, 173
Nutrient solution, 463
O_2 evolution, 539
Old trees, 151
Oligosaccharide, 79
Organic acid, 185
Organic acids, 201
Oryza sativa (rice), 427
Oxygen, 219
Ozone, 283
Ozone injury, 271
Palm, 335
Parental effects, 173
Paxillus involutus, 141
PCR-RFLP, 577
Penetrometer, 421
Peridinium gatunense, 27
pH, 201
pH change, 185
Phanerochaete velutina, 325
Phenology, 475
Phenotypic plasticity, 173
Phosphate, 185
Phosphoenolpyruvate carboxylase, 441
Phosphorus translocation, 325
Photosynthesis, 315
Phragmites, 201
Physiology, 373
Phytohormones (ethylene, auxin), 307
Picea abies (Norway spruce), 259
Pigment, 315
Pinus, 49
Pinus pinea (pine), 307
Pinus ponderosa, 355
Pinus sylvestris, 151
Pisum sativum, 517
Pisum sativum (pea), 421
Plant functional type, 475
Plant strategy, 283
Poaceae, 451
Polymerase, 79
Polyphosphate, 531
Polysaccharide, 79
Pseudomonas fluorescens, 113
Pteridium aquilinum, 243
Purification, 427
Relative elemental growth rate, 435
Rhizobium, 219
Rhizome, 35
Rhizopogon, 355
Rhizosphere, 113, 185, 441
Ribosomal DNA, 577
Rice (*Oryza sativa*), 185
Root apices, 505
Root cap, 421
Root meristem, 49
Root pathogens, 505
Root penetration, 421
Salinity, 441
Scots pine (Pinus sylvestris), 141
Sedge, 163
Seedlings, 151
Seeds, 173
Sensitivity, 233
Shoots, 427
Silicon, 463
Soil depth, 495
Soil impedance, 59
Soil moisture deficit, 271, 283
Solanum tuberosum (potato), 5
Solubilization, 185
Soluble, 27
Spore germination, 347
Stable isotopes, 93, 569
Stains, 123
Stem infusion, 19
Stress, 201
Structure, 373
Sucrose, 79
Sugar, 295
Supernodulating mutants, 233
Symbiosis, 551
Temperate, 335
Temperate forest, 93
Temperature rise, 243
Thigmotropism, 59
Top dying, 259
Toxins, 201
Tracheid differentiation, xylem (differentiation, regeneration), 307
Transgenic tobacco, 67
Translocation, 201
Trees, 569
Trypan Blue, 123
Tuber, 5
Vacuole, 79
Vapour pressure deficit, 271
Vegetative storage proteins, 451
Vertisol, 495
Viability, 505
Volatile, 5
Water bloom algae, 27
Water potential gradient, 435
Water stress, 295
Water-soluble carbohydrate (WSC), 295
Zea mays (maize), 421
Zinc, 141